

Ytong Multipor Mineral Insulation Boards

Interior Insulation



YTONG
—multipor



Why insulate exterior walls on the inside?

When exterior walls are insulated on the inside using Ytong Multipor Mineral Insulation Boards, a vapour barrier is not required!

A frequently asked question: "Does insulating exterior walls on the inside work and what advantages do Ytong Multipor Mineral Insulation Boards offer in comparison to conventional insulating materials?"

Older buildings frequently have poor thermal insulation if any at all. In winter insufficient thermal insulation on the outside walls lead to increased energy consumption and in the summer to high interior temperatures. In most cases, this results in an uncomfortable interior climate and in unfavourable cases can even lead to significant construction damage.

On buildings where it is not possible to insulate exterior walls from the outside because the facade is protected as a historical monument or needs to be saved for other reasons, interior insulation is frequently the only proper solution.

In rooms such as churches or public buildings which are only used partially, interior insulation allows them to be heated up quickly. Insulating exterior walls on the inside using Ytong Multipor Mineral Insulation Boards allows significant improvement of the thermal insulation and therefore the comfort inside the buildings.

The thermal insulating value is maintained and the moisture in the inhabited room is regulated naturally. In contrast to synthetic or mineral fibre insulating mats, water condensing inside the Ytong Multipor Mineral Insulation Boards is enclosed by the cell walls and absorbed by the thermally insulating air pores and returned to the air in the room in a natural manner as the mineral material dries.

Foamed insulating materials have a significantly higher μ value and therefore do not necessarily contribute to regulation of the room climate.



Reconstruction of the old weaving mill in Fulda, following a fire: Interior insulation with Ytong Multipor mineral insulating system

Clear case: Ytong Multipor for energy-saving building rehabilitation!

Hard facts

The number of residences requiring repair and modernization is nearly 37 million. Moreover, there are over 1 million buildings protected as historical monuments in need of renovation.



Ytong Multipor Interior Insulation – Applications, Purposes and Objectives	
Where can Ytong Multipor interior insulation be used?	<ul style="list-style-type: none"> ■ Old and new buildings ■ Restoration of old buildings ■ Buildings protected as historical monuments ■ Schools, nurseries, churches ■ Hospitals, social facilities ■ Office buildings to be renovated during work
What requirements can Ytong Multipor interior insulation satisfy and what solutions can it provide?	<ul style="list-style-type: none"> ■ Facade to remain as is, e.g. visible masonry ■ To achieve satisfactory thermal insulation on facades protected as historical monuments ■ Allow quick heatup of interior; e.g. in schools, churches, office buildings, etc. ■ Create a healthy room climate ■ When exterior insulation is not possible technically or legally, e.g. buildings on boundary, lot boundaries

Thermal building renovation with Ytong Multipor!

Reduction of heating costs

Heat is lost in many existing buildings, however, the energy consumption in nearly all buildings can be reduced significantly by subsequent thermal insulation measures.

Increased value of buildings

Properly planned and executed renovation protects the building substance and prevents building damage. The resale and long-term value of real-estate is increased on a sustained basis by optimum thermal insulation.

Renovation economy

Thermal modernization work is not only practical, but also particularly economical when maintenance work, conversions or expansions are planned.

Renovation to prevent mould and moisture

Damage from mould and moisture is often the result of incorrect ventilation. However, it can also result from extremely low surface temperatures on exterior building parts. Here, specific interior insulation with Ytong Multipor Mineral Insulation Boards provides a remedy.

Increase in living comfort

The various insulating measures in combination with a state-of-the-art heating system increases the living comfort. A pleasant room climate without annoying drafts contributes to your well-being.

Climate protection

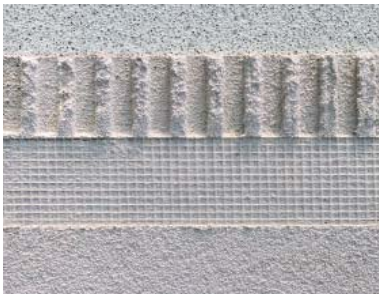
Nearly one third of the total primary energy consumption is used in private households. Approx. 77 % of this is used for heating. Nearly 37 million residences in Germany can profit from subsequent insulation for significant reduction of their energy consumption.



Renthof in Kassel: Renovation of a building under protection as a historical monument to obtain a functioning office/commercial building with dental laboratory

Ytong Multipor: the optimum, capillary attraction system for interior insulation

Ytong Multipor mineral insulation boards are ideal for optimum constructional solutions for interior insulation on exterior walls – complicated insulating constructions are a thing of the past.



Layer composition: Ytong Multipor mineral insulation board, light mortar, reinforcement with reinforcement layer consisting of Ytong Multipor light mortar and Ytong Multipor reinforcement mesh

When renovating facades under protection as historical monuments or with complicated design, interior insulation is frequently the only possibility to effectively improve the thermal insulation without changing the appearance of the facade.

Ytong Multipor Mineral Insulation Boards provide "tremendous advantages" particularly for renovating old buildings. They are suitable for insulating exterior walls on the inside without vapour barrier making them ideal for sustained thermal renovation of old buildings.

In addition to the thermal insulation, fire protection also plays an increasingly important role. Use of non-combustible insulating materials which do not develop toxic gases in a fire, is becoming increasingly

required for reconstruction and renovation as well as new construction by building codes.

Particularly suited for insulation work on large areas as well as for angular and highly articulated walls.



"Tradesmen don't like using unfamiliar materials ..."

Prejudices and advantages

Insulating materials for interior insulation consisting of mineral wool or expanded or extruded polystyrene foam boards are well known. Isn't it about time to think ahead and start using something new and ecological?

... new, unknown and no experience with

Not true!

The Ytong Multipor insulating system has proven itself extremely well on ceiling and walls surfaces. Our experienced consultants are available for support for your next project with Ytong Multipor.

... difficult to process

Not at all!

The solid insulation boards with their stable shape can be glued onto walls right down to the smallest angle quickly and securely.

... certainly too expensive

Not true!

In addition to the low material costs, minimum processing times, even for complicated details, provide clear cost advantages.

... not approved

Simply request!

Ytong Multipor Mineral Insulation Boards are a silicate insulating material and have a European technical approval (ETA-05/0093) as well as general construction supervisory ap-

proval Z-23.11-1501. Ytong Multipor Mineral Insulation Boards are classified as biologically unobjectionable and recommendable in terms of construction biology, according to the Institut Bauen und Umwelt e.V. [Construction and Environment Institute] (IBU e.V.) EPD-XEL-2009212-D, they are completely recycleable and have been awarded the Naturplus Quality Certificate 0404-0812-0881.

... what about fire protection?

Very simple!

The Ytong Multipor insulating system consisting of mineral insulation boards in fire classification A1, and the light mortar, is non-combustible. In the event of a fire, these system components do not form any toxic gases and are therefore optimally suited for insulating material for interior insulation on exterior walls.

... absorb moisture like a sponge

On the contrary!

Their excellent diffusion characteristics and the capillary structure of Ytong Multipor mineral insulation boards prevents a long-term incre-

ase in moisture at common temperatures and humidity conditions – without the use of expensive vapour barriers.

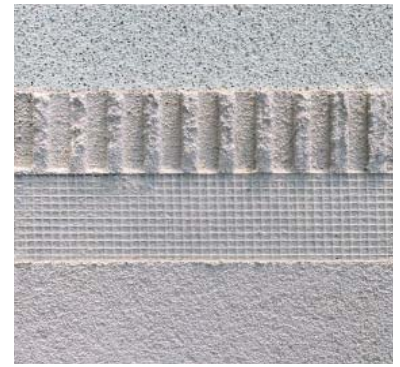
... and disposal?

No problem!

Ytong Multipor is not classified as special or hazardous waste. Ytong Multipor insulation boards do not contain any pollutants. This eliminates the disposal problems commonly encountered with insulating materials. And even better: The insulation boards are completely recycleable!



Ytong Multipor Mineral Insulating System



Exceptional material properties and simple processing make Ytong Multipor mineral insulation boards the optimum material for interior insulation.

Ytong Multipor Mineral Insulation Boards

Minerally and ecologically Ytong Multipor Mineral Insulation Boards offer a new quality for thermal insulation:

- homogeneous
- high thermal insulation factor
- non-combustible
- stable shape, non-compressible
- open for vapour diffusion
- ecological

Production

Ytong Multipor Mineral Insulation Boards are produced in an ecological and energy-saving process using the raw minerals lime, sand, cement and water under steam pressure.

Ytong Multipor Light Mortar for Gluing, Reinforcing and Plastering

- natural white
 - easy processing
 - high adhesive force
 - good stability
 - high yield
 - water repellent
 - open for vapour diffusion
 - frost-resistant
 - non-combustible
- Delivery and processing instructions:
- Storage: Store dry on pallet, up to 12 months
 - Delivery form: 20 kg/Sack
 - Processing time: approx. 1.5 h
 - Ambient temperature: $\geq 5\text{ }^{\circ}\text{C}$
- Mineral gluing and reinforcement mortar
- Consumption for gluing: approx. 3–4 kg/m²,
 - Consumption for reinforcement 3 kg/m²
 - High yield: approx. 6 m² at 5 mm layer thickness or 1,500 l/to

Ytong Multipor repair mortar

For repairs and filling damaged points

Accessories

- Ytong Multipor insulating wedge
- Ytong Multipor reveal board
- Ytong Multipor reinforcement mesh fabric
- Ytong Multipor flat anchor
- Ytong Multipor measuring bucket to ensure optimum processing consistency of light mortar

Processing tools

- Toothed trowel (teeth $\leq 140\text{ mm}$ board thickness = 10 mm, for board thicknesses greater than 160 mm = 12 mm)
- Electric drill with mixer
- Hand saw
- Sanding board

Technical Data		
	Ytong Multipor Mineral Insulation Board	Ytong Multipor Light Mortar
Approval	European Technical Approval ETA-05/0093 General Construction Supervisory Approval Z-23.11-1501	
Areas of application	Interior insulation on walls and ceilings (WI, WTR)	
Density	approx. 115 kg/m ³	
Thermal conductivity	$\lambda = 0.045\text{ W/mK}$	$\lambda_{10, dry} = 0.18\text{ W/mK}$
Water vapour diffusion resistance coefficient	$\mu = 3$ open for vapour diffusion	$\mu = \leq 10$
Fire classification	Non-combustible - fire classification A1 according to DIN EN 13501-1	A2 - non-combustible
Compressive strength	Average $\geq 300\text{ kPa}$	CS II - 1.5 - 5.0 N/mm ²
Bending strength	$\geq 80\text{ kPa}$	

Board Formats/Quantities	
Length x Width 600 x 390 mm	
Thicknesses	m ² /pallet
50 mm	33.70
60 mm	28.08
80 mm	21.06
100 mm	16.85
120 mm	14.04
140 mm	11.23
160 mm	9.83

Special dimensions available on request

Ytong Multipor – the perfect alternative for interior insulation

Advantages

Quick adhesion

Ytong Multipor Mineral Insulation Boards can be installed quickly and easily by simply gluing them to the walls with Ytong Multipor light mortar. This self-adhesive installation is particularly advantageous for walls which are not straight. On large surfaces, experienced workmen achieve high installation rates – low installation times provide clear advantages. Lower wage costs

Easy to process

The handy format and low weight of Ytong Multipor Mineral Insulation Boards minimize the force required. Fitted pieces and cutouts around pipe passages can be cut easily and precisely. Easy handling

Clean surface

Minor irregularities in the subsurface can be compensated easily using Ytong Multipor light mortar. Projections at joints can be easily sanded down flat with a sanding board. Spick and span

The reinforced Ytong Multipor light mortar can be finished with a thin layer of structured plaster, painted or wall-papered.

Simple to fasten loads

Pictures, rail systems and decoration can be installed easily on the interior insulation. Punctual loads up to 3 kg are possible depending on the type of fixation. Heavy loads can be fastened in the subsurface.

Shaping

Ytong Multipor Mineral Insulation Boards are easy to adapt to projections, reveals and other wall shapes. Flexible and easy to process surface design is simple. Maintains aesthetic appearance of walls

Remedy for mould

Frequently interior insulation is used specifically to eliminate damage from moisture and mould. Insulation frequently increases the surface temperature on the inside of exterior walls so that moisture no longer condenses on the previously cold surfaces. Mould prevention

Ecologically perfect

Ytong Multipor Mineral Insulation Boards have been awarded the certificate AUB-XEL-10106-D by the Deutschen Institut für Bauen und Umwelt [German Construction and Environmental Institute] (DIBU), previously known as "Arbeitsgemeinschaft Umweltverträgliches Bauprodukt e.V." classifying them as biologically unobjectionable and recommendable for biological construction (www.multipor.de). Moreover, wastes and residues can be disposed of easily as construction rubble.

Simple to dispose of

Sustainable product for long-term use

Stable shape, non-combustible, quick and economical



Natureplus quality symbol

Thermal and acoustic insulation for protection against fire and moisture

Building physics

Thermal insulation

Ytong Multipor Mineral Insulation Boards consist of 100% homogeneous material with a thermal conductivity of $\lambda = 0.045 \text{ W/mK}$. Excellent values can be achieved in this manner.

Minimum energy loss

Thermal resistance R [m ² K]/W	
Thickness	[m ² K]/W
50 mm	1.11
60 mm	1.33
80 mm	1.78
100 mm	2.22
120 mm	2.67
140 mm	3.11
160 mm	3.56

Fire protection

Non-combustible Ytong Multipor mineral insulation boards in fire classification A1, combined with Ytong Multipor light mortar ensure absolute safety in the event of a fire.

Even at maximum temperatures, this insulating material does not develop any toxic gases or smoke - a true advantage when searching for escape routes and performing vital rescue measures during a fire. absolutely non-combustible

Acoustic insulation

In spite of their high porosity of 95% by volume, the Ytong Multipor Mineral Insulation Boards do not have any negative influence on the acoustic insulation as an insulating material.

Solid interior insulation provides pleasant acoustic characteristics in the interior.

Acoustically neutral

Protection against moisture

Ytong Multipor Mineral Insulation Boards have a material percentage of only 5% and are permeable to vapour.

A large number of closed air-filled pores ensure a maximum material surface for absorbing water condensation which can then be transported through the capillaries. This open vapour diffusion ensures quick diffusion of the water.

In summer, this ensures quick drying and the insulating effect is not impaired.

System with active capillaries for open vapour diffusion



Thermographic images clearly show the quality of insulation

Thermographic images can be created with the aid of an infrared camera to show the points on a building where the thermal insulation is good or poor.

The images shown here indicate the improvement in the thermal insulation using the Ytong Multipor mineral insulating system before and after renovation using thermographic images.

Example:
The "Hofreite" in Wölfersheim is protected as a historical monument – the exterior walls were insulated on the inside using the Ytong Multipor mineral insulating system.

Fig. 1: Exterior photograph

In the uninsulated state, it is easy to recognize that the brick facade heats up highly and that the thermal insulation is insufficient. The significant heatup of the masonry as a result of high room temperatures is recognizable from the yellow to violet color.



1a: Original photograph



1b: Thermographic image

Fig. 2: Interior photograph of uninsulated wall

Uninsulated masonry is cool at low outdoor temperatures and the green shades indicate unfavourable thermal insulation. Hot elements such as radiators or vertical heating pipes appear yellow to dark red.



2a: Original photograph



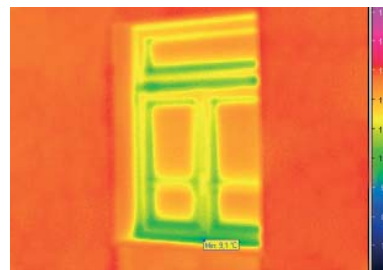
2b: Thermographic image

Fig. 3: Interior picture of thermally insulated wall

The orange-red color of the wall insulated with Ytong Multipor Mineral Insulation Boards indicates ideal thermal insulation. The high temperature on the wall surface is maintained without heat loss.



3a: Original photograph



3b: Thermographic image

Glued – plastered – insulated!

Processing

Mix light mortar ...



Mixing light mortar. 20 kg mixed with 8 l of water (mark on measuring bucket) yields approx. 30 l of adhesive mortar.

and apply



Apply over full surface and comb smooth with toothed trowel (≤ 140 mm board thickness = 10 mm, board thickness greater than 160 mm = 12 mm).

no drilling or anchoring



Base height of light mortar approx. 8 – 10 mm. This allows irregularities up to 3 mm in the subsurface to be compensated.

Easy to position ...



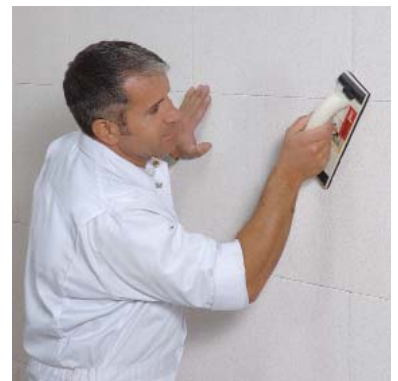
Position mineral insulation boards immediately in light mortar at intervals of approx. 2 cm to previous board on the wall.

press on ...



Press onto wall surface with appropriate pressure and move against previous boards.

... and sand flush if required



Offset points can be leveled quickly and easily with a sanding board after setting.

Apply light mortar ...



Apply light mortar for reinforcement layer with toothed trowel.

embed mesh ...



Apply reinforcement mesh ...

and work in



... and work in with trowel.

Ytong Multipor interior insulation: nothing is simpler

Inspecting and Checking Subsurface

Plan measures for improving glue adhesion. Fill damaged spots in masonry such as wall passages no longer required, ventilation openings, cable ducts, etc. with Ytong Multipor repair mortar. Where applicable, lay pipes and electrical lines in slits.

Fastening hardware at www.multipor.de

Preparation of subsurface



Check subsurface for evenness and apply compensation plaster if necessary.

Fitted pieces



Simple to cut exactly with handsaw.

Increasing supporting capacity



Increase supporting capacity of insulation boards for tiles (up to weight of 12 kg/m²) or similar using 4 insulation anchors/m².

Wall facing boards



Position and attach gypsum fibre boards on subconstruction.
Information available at www.fermacell.de

Notes on wall facing boards:

When using wall facing boards, fasten the subconstruction, e.g. wooden frame, to the subsurface through the Ytong Multipor mineral insulation boards using suitable fastening hardware. The boarding consisting of elements such as 12.5 mm FERMACELL gypsum fiber boards can be fastened to the subconstruction with staples, drywall screws or hollow head nails.

Surface design



The finish plaster can be given a harmonious design using a sponge technique ...



... or brush technique in the Ytong Multipor light mortar. Coloured finish with silicate interior wall paint.

Mounts



Cut reinforcement mesh with knife and pound in Ytong Multipor flat anchor horizontally flush with wall.

Interior insulation on exterior walls with Ytong Multipor without vapour barrier

On many older buildings where exterior insulation is not possible, interior insulation is frequently the only possibility of improving the thermal insulation. The thermal insulation and therefore the comfort inside the building can be improved considerably by insulating the exterior walls on the inside with Ytong Multipor Mineral Insulation Boards - without any expensive barriers.

Condensing water is encased by the cell walls in the Ytong Multipor mineral insulation boards and absorbed by thermally insulating air pores; it is returned to the air in the room as the mineral material dries naturally.

All of the layer constructions illustrat-

ed on the disk using Ytong Multipor for interior insulation were tested by means of climatic simulation. A mid-German climate with temperature, relative humidity, direct and indirect sunlight as well as driving rain was simulated on the outside. The interior climate was assumed as specified in DIN 4108 as a constant air temperature of 20 °C and relative humidity of 50%.

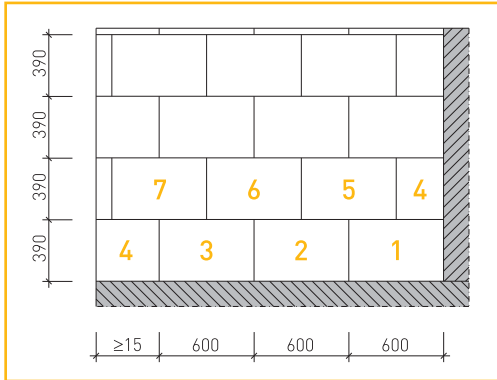
The calculations show that during the cold half of the year, any condensate occurring in the layer construction is not critical, because it dries out completely during the summer half-year in all cases .

Always observe the current processing instructions when processing Ytong Multipor .



Details can be completed easily

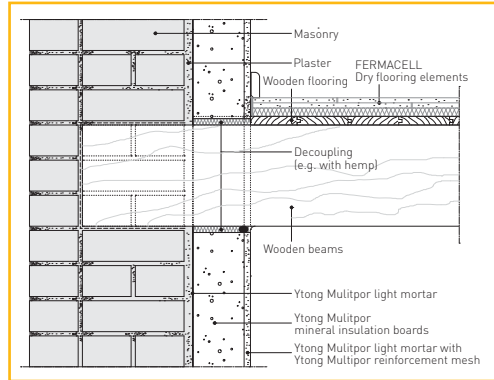
Ytong Multipor Installation Instructions



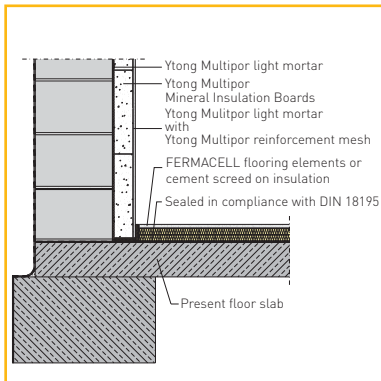
Before starting installation, check to ensure that the surfaces are at right angles to one another and mark with a marking line.

Lay boards in overlapping pattern.

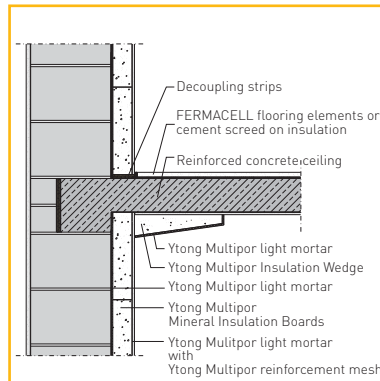
Ceiling Connection 2



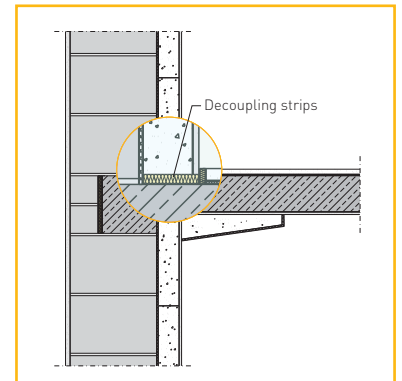
Floor connection



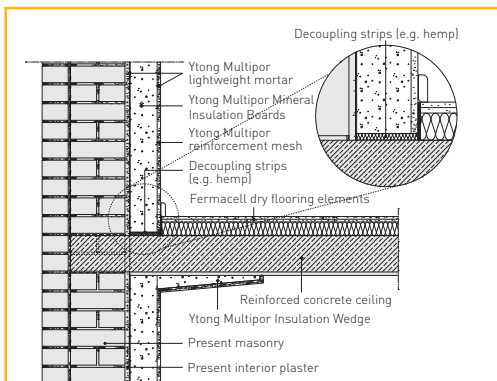
Ceiling Connection 1



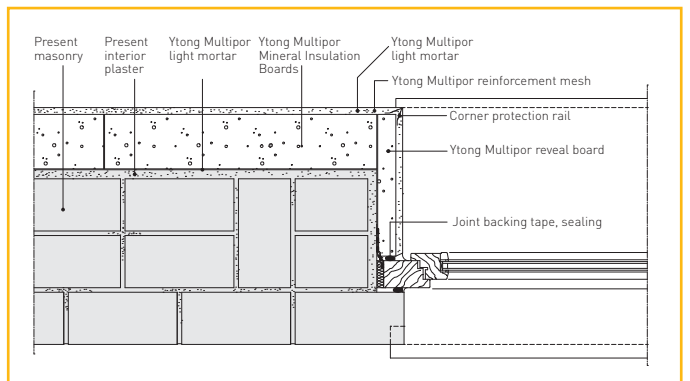
Decoupling strips



Floor connection



Window connection, horizontal





Old weaving mill in Fulda, damaged highly by fire, completely rebuilt

Still skeptical? Then check our references



Staubach + Partner, Fulda, Architect Witte:

"I was surprised at the capabilities offered by the Ytong Multipor Mineral Insulation Boards. The Ytong Multipor Mineral Insulation System is really outstanding in terms of its construction physics and design possibilities."



Just look at this!



Classic and modern architecture



Old elements ...



... recombined



Renthof, Kassel – modern thermal insulation on historical building



The classic style is an integral part of the Kassel city image.



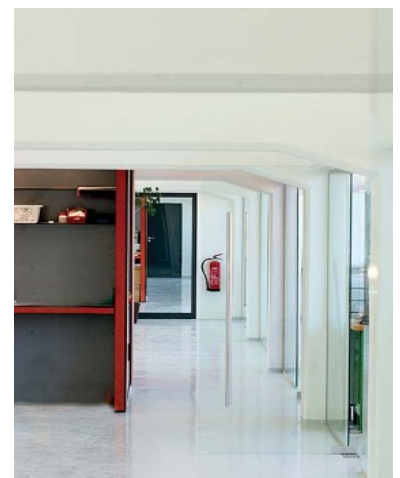
Hightech behind historical facade



Present portals reintegrated



Clear combination of old ...



... and new architecture

Ytong Multipor – aesthetic, light and friendly



Builder/owner Paul Gerhard Hoffmann, Wölfersheim:
"In consideration of the high requirements for protecting this historical monument, insulating the inside of the exterior walls with Ytong Multipor Mineral Insulation Boards was certainly the best solution."



Old building becomes low energy building.



A historical building with unchangeable facade



Insulating exterior walls on the inside with Ytong Multipor Mineral Insulation Boards allowed successful conversion of a nearly 80 year old farmhouse.



The characteristics of the room were maintained perfectly.



Combination of thermal insulation and open vapour diffusion

Interior insulation for your historical building



Ytong Multipor as interior insulation allowed the appearance of this historical building to be maintained while improving the insulating value to nearly that of a "standard passive building".



Awaken to life after standing empty for eight years



Ytong Multipor, the capillary interior insulation of the future





Note: This brochure was published by Xella Deutschland GmbH. Our publications provide advise and information according to the best of our knowledge and the state of the art at the time of publication.

Since legal rules and regulations are subject to change, this information is not legally binding.
It is necessary to check the applicable regulations in each individual case.

Xella Deutschland GmbH

Xella Customer Information

 08 00-5 23 56 65 (freecall)

 08 00-5 35 65 78 (freecall)

 info@xella.com

 www.ytong-multipor.de